

VU Research Portal

Mechanisms underlying synapse formation and post-synaptic receptor targeting

Farzana, F.

2016

document version

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

citation for published version (APA)

Farzana, F. (2016). *Mechanisms underlying synapse formation and post-synaptic receptor targeting*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

E-mail address:

vuresearchportal.ub@vu.nl

TABLE of CONTENTS

Chapter 1	General Introduction	9
1.1	Synaptogenesis	10
1.2	Synaptic Cell Adhesion Molecules	13
1.3	Leucine Rich Repeat Proteins	16
1.4	Synaptic Adhesion Like Molecule 1	18
1.5	Postsynaptic Receptor Trafficking	20
1.6	Scaffolding Proteins	22
1.6.1	MAGUKs	
1.6.2	AKAPs	
1.7	BEACH domain family of proteins	24
1.7.1	Neurobeachin	26
1.8	Aim of Thesis	28
 Chapter 2	 Synapse Associated Protein 102 (SAP102) binds the C-Terminal Part of the Scaffolding Protein Neurobeachin	
	Abstract	32
2.1	Introduction	33
2.2	Results	35
2.3	Discussion	43
2.4	Experimental Procedures	45
	Supplemental figures	49
 Chapter 3	 Neurobeachin regulates glutamate- and GABA-receptor targeting to synapses via distinct pathways	
	Abstract	58
3.1	Introduction	59
3.2	Results	60
3.3	Discussion	69
3.4	Experimental Procedures	72
	Supplemental figures	74

Chapter 4 Synaptic Adhesion Like Molecule 1 (SALM1) interacts with CASK and regulates Excitatory Synapse Formation

Abstract	78
4.1 Introduction	79
4.2 Results	80
4.3 Discussion	88
4.4 Experimental Procedures	92
Supplemental figures	94

Chapter 5 Bilateral depletion of SALM1 results in reduced synaptic transmission while unilateral depletion does not affect synapse number or synaptic transmission

Abstract	100
5.1 Introduction	101
5.2 Results	102
5.3 Discussion	108
5.4 Experimental Procedures	111
Supplemental figures	113

Chapter 6 General Discussion 115

6.1	Nbea-SAP102-NMDAR complex targets glutamate receptors to the synapse surface	116
6.2	Nbea, as an AKAP, modulates receptor expression	118
6.3	Clinical importance of Nbea	120
6.4	SALM1's role in development of the neuron	122
6.5	Mechanism of SALM1 in synaptogenesis	126
6.6	Future perspectives	126

Bibliography	131
Summary	150
Publications	153
Acknowledgements	155
About the Author	159